

REMARKS

By this amendment, claims 3 and 19 have been cancelled. Claims 1, 4, 5, 17, 20, and 21 have been amended. **Claims 1-37 remain pending, of which claims 17-32 and 35-37 are withdrawn from consideration.** Support for the instant amendments is provided throughout the as-filed application. Thus, no new matter has been added. In view of the following comments, allowance of all the claims pending in the application is respectfully requested.

ALLOWABLE SUBJECT MATTER

Claim 4 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant appreciates the indication that claim 4 is allowable and therefore it has been amended to be in independent form.

REJECTION UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claim 5 was rejected under 35 U.S.C. §112, second paragraph. Claim 5 has been amended to further clarify the claim language. Accordingly, the withdrawal of this rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. §102

Claims 1, 3, and 5-6 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 6,397,776 to Yang, *et al.* (hereinafter "Yang"). Applicant traverses this rejection because the cited portions of the relied upon reference do not disclose each and every aspect of the claimed invention.

Claim 3 has been cancelled. The features of original claim 3 are now recited in amended claim 1. Thus, the rejection of claim 3 is deemed moot.

For a reference to anticipate a claim, “the identical invention **must** be shown **in as complete detail as is contained in the ... claim.**” MPEP § 2131, citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added). MPEP §2131 also indicates that “the elements **must be arranged as required by the claim.**” MPEP § 2131 (citing In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)) (emphasis added); *see also* Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359 (Fed. Cir. 2008)(Linn, J.), distinguishing Glaxo Group Ltd. v. Apotex, Inc., 376 F.3d 1339, 1348 (Fed.Cir.2004) (“the test for anticipation by a single reference under 35 USC § 102 requires that a single reference not only disclose all elements of the invention, but that the elements be ‘arranged or combined in the same way as in the claim’”). Respectfully, the Office Action does not meet these requirements.

Claim 1, as amended, recites a method for applying a coating on a substrate, comprising: a coating process including arranging, opposite the substrate, at least two expanding thermal plasma (ETP) sources which provide the substrate with a coating, wherein the substrate is located in a process room in which the pressure is lower than the pressure, prevailing in the ETP sources, of a carrier gas which is introduced into the process room via the sources and which forms the expanding plasma, wherein the coating provided by each source has a layer thickness according to a deposition profile; choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between the at least two sources producing plasma plumes at the same time; and setting the distance such that the expanding plasmas substantially do not influence each other, in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions. Yang fails to disclose or anticipate the recited features of claim 1, as amended.

The Examiner alleges [with regard to the features of claim 3, now recited in claim 1] that Yang explicitly discloses the arrangement of ETP sources as claimed, and that such an

arrangement will provide at least two sources wherein the sources are spaced apart such that the ETP sources do not “substantially” influence each other (emphasis added). *See* Office Action, page 4. Applicant disagrees, and respectfully submits that the Examiner is misinterpreting the disclosure of Yang.

Specifically, a closer reading of Yang shows a plurality of expanding thermal plasma (ETP) sources that are spaced such that the plasma plumes will overlap: “Spacing of the ETP generating means also has an effect on the uniformity of the coating deposited on the substrate. In order to maximize uniformity, it is preferred to provide a spacing such that there is overlap between the edge portions of the plurality of plasma plumes.” (Emphasis added) *See, e.g.*, Yang at column 6, lines 22-26; column 3, lines 18-21. The plumes of Yang intersect each other and there is an area of the substrate contacted by both plumes. Thus, Applicant submits the Examiner’s allegation that the ETP sources “do not substantially” influence each other is incorrect. Yang clearly describes that it is desirable to have the plumes overlap in order to achieve a more uniform coating.

By contrast, the method of claim 1 recites that the at least two ETP sources are spaced so that their plasma plumes do not substantially influence each other, “in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions.” One of the ways the claimed method solves the problem of providing a uniform thickness of deposition on the substrate is by avoiding interference between neighboring plasma plumes. *See, e.g.*, Applicant’s Specification, page 8, lines 1-11. Such features are not explicitly disclosed in Yang. Rather, as noted above, Yang aims to overlap edge portions of the plurality of plasma plumes. *See, e.g.*, Yang at column 6, lines 22-26.

Applicant submits that the claimed method limitations of “choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between the at least two sources

producing plasma plumes at the same time; and setting the distance such that the expanding plasmas substantially do not influence each other, in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions," are also not inherent in Yang. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

For example, even though Yang notes that the precise amount of overlap will depend on numerous factors and that optimum spacings for each coating apparatus can be determined by experimentation, Yang clearly aims to overlap edge portions of the plurality of plasma plumes. *See, e.g.*, Yang at column 6, lines 22-42. There is no explicit or implicit disclosure, teaching, or suggestion that the plumes are set at a distance such that the expanding plasmas substantially do not influence each other, in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume, as recited in amended claim 1.

Moreover, Applicant submits that the interference of the plasma plumes of Yang will not provide uniform layer thicknesses. As Applicant pointed out in the original specification of the invention with regard to Yang, "... the plasma plumes of the ETP sources will interfere with each other and will push each other away. As a result of this phenomenon, interference-like deposition patterns have been found to arise between the sources, so that, there, the layer

thickness is not uniform. The tables of tests included in the respective publication show considerable layer thickness differences.” See, e.g., Table I, column 9, lines 35-55 and Applicant's Specification, page 1, lines 17-22. Extensive testing has revealed that intersecting plasma plumes provide inference-like deposition patterns, so that, therefore, the layer thickness is not uniform.

For at least these reasons, Yang fails to disclose or anticipate the features of amended claim 1.

Claims 5-6 depend from claim 1 and therefore are also allowable over the cited portions of the relied upon references for the reasons noted above with respect to claim 1, as well as for the features they recite individually.

For at least the reason that the cited portions of Yang do not disclose each and every claim aspect, the rejection of claims 1 and 5-6 should be withdrawn. Applicant respectfully requests indication that claims 1 and 5-6 are allowable over Yang.

REJECTION UNDER 35 U.S.C. §103

Claims 3, 5-11, and 34 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang. Applicant respectfully traverses.

Claim 3 has been cancelled. The features of original claim 3 are now recited in amended claim 1. Thus, the rejection of claim 3 is deemed moot.

Claims 5-11 and 34 depend from claim 1 and are patentable over Yang based on their dependency and for the additional features recited therein.

Applicant submits that no *prima facie* case of obviousness has been established because the cited portions of Yang do not disclose, teach, or render obvious each and every claim aspect.

For example, as noted above, Yang fails to disclose, teach, or suggest, “choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the

substrate, wherein one of the process parameters to be chosen is the distance between the at least two sources producing plasma plumes at the same time; and setting the distance such that the expanding plasmas substantially do not influence each other, in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions,” as recited in claim 1. Again, Yang clearly aims to overlap edge portions of the plurality of plasma plumes in order to maximize uniformity of a coating on a substrate. However, there is no disclosure, teaching, or suggestion that a distance between at least two sources producing plasma plumes is set so that the plasmas do not substantially influence each other, and that the shape of each of the plumes substantially corresponds to the shape of a single plume.

Furthermore, Yang fails to disclose, teach, or suggest the features recited in claims 5-11 and 34. Just for example, Yang fails to provide “wherein the arc flow of the source located on the third angular point is chosen to be lower than the arc flows of the other two sources,” as recited in claim 8 (which includes the features of claims 7, 6, 5, and 1, based on its dependency), and “wherein one of the process parameters to be chosen, and to be varied depending on the other process parameters, for influencing the resulting layer thickness uniformity is an arc flow of each of the at least two sources,” and recited in claim 34. Yang merely mentions that an arc generator may be used. However, there is no disclosure, teaching, or suggestion that the arc flow of a source is varied or selected in Yang as recited in claims 8 and 34.

For at least the reasons that the cited portions of Yang do not disclose, teach, or render obvious each and every claim aspect, the rejection of claims 5-11 and 34 should be withdrawn. Applicant respectfully requests acknowledgement that claims 5-11 and 34 are allowable over Yang.

Claims 2 and 12-15 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of U.S. Patent No. 6,140,773 to Anders, *et al.* (hereinafter "Anders"). Applicant respectfully traverses.

Claims 2 and 12-15 depend from claim 1 and are patentable over Yang based on their dependency and for the additional features recited therein.

As admitted by the Examiner, Yang fails to disclose "measuring thickness variations over a surface of the substrate of the layer obtained after the coating process, and subsequently, adjusting the process parameters for reducing the measured thickness variations," as recited in claim 2. *See* Office Action, page 6. Anders is recited as allegedly disclosing thickness control using feed back control. *Id.* The Examiner alleges that it would have been obvious to one of ordinary skill in the art to modify Yang to use the feedback control techniques of Anders, because doing so would have led to predictable and successful results. Applicant disagrees.

Applicant submits that no *prima facie* case of obviousness has been established because (1) there is no teaching, suggestion, or reason to combine the cited portions of Yang and Anders; and (2) the cited portions of Yang and Anders, even if combined, do not disclose, teach, or render obvious each and every claim aspect.

Even if Yang and Anders could be combined, which Applicant does concede, a combination thereof would fail to disclose, teach, or suggest at least, "choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between the at least two sources producing plasma plumes at the same time; and setting the distance such that the expanding plasmas substantially do not influence each other, in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions," as recited in claim 1. Anders fails to remedy the deficiencies of Yang. Anders merely notes that the spacing distance between cells of its sources may be determined by empirical measurements.

However, the recited features of independent claim 1, from which claims 2 and 12-15 depend, are not disclosed, taught, or suggested by Anders.

Accordingly, any combination of Yang and Anders would fail to disclose, teach, or suggest the recited features of claims 2 and 12-15.

For at least the reason that the cited portions of Yang and Anders, either alone or in combination with one another, do not disclose, teach, or render obvious each and every claim aspect, the rejection of claims 2 and 12-15 should be withdrawn. Applicant respectfully requests acknowledgement that claims 2 and 12-15 are allowable over Yang, Anders, and/or a combination thereof.

Claim 11 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of European Patent Application No. 985742 A2 (hereinafter “EP ‘742”). Applicant respectfully traverses.

Claim 11 depends from claim 1 and is patentable over Yang based on its dependency and for the additional features recited therein. Claim 11 recites, “wherein one of the process parameters to be chosen, and to be varied depending on the other process parameters, for influencing the resulting layer thickness uniformity is an outflow angle of plasma plumes relative to the substrate.” The Examiner cites EP ‘742 as explicitly disclosing that controlling the plasma outflow angle provides certain benefits, and that adjusting such would have been obvious through routine experimentation. *See* Office Action, page 7. Applicant disagrees.

Applicant submits that no *prima facie* case of obviousness has been established because (1) there is no teaching, suggestion, or reason to combine the cited portions of Yang and EP ‘742; and (2) the cited portions of Yang and EP ‘742, even if combined, do not disclose, teach, or render obvious each and every claim aspect.

Even if Yang and EP ‘742 could be combined, which Applicant does concede, a combination thereof would fail to disclose, teach, or suggest at least, “choosing different process parameters such that, after the coating process, addition of the deposition profile

results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between the at least two sources producing plasma plumes at the same time; and setting the distance such that the expanding plasmas substantially do not influence each other, in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions," as recited in claim 1. EP '742 fails to remedy the deficiencies of Yang.

For example, EP '742 describes using a plurality of distribution heads 18 wherein a first distribution head 18 has a first central impingement point on a substrate 32 and a second distribution head 18 has a second central impingement point on the substrate 32, the second central impingement point being within a half of a profile width of the first central impingement point. *See, e.g.*, EP '742 at page 4, paragraphs [0017]-[0018] and [0020] and claim 6. That is, the distribution heads are preferably spaced relatively apart (from center to center) with respect to a defined profile width. As is clear from FIG. 3 of EP '742, the plasma plumes intersect. EP '742, therefore, provides a similar arrangement and interference problems as described above with respect to Yang.

For at least the reason that the cited portions of Yang and EP '742, either alone or in combination with one another, do not disclose, teach, or render obvious each and every claim aspect, the rejection of claim 11 should be withdrawn. Applicant respectfully requests acknowledgement that claim 11 is allowable over Yang, EP '742, and/or a combination thereof.

Claim 16 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of Anders and further in view of Japanese Patent Application No. 09-111435 (hereinafter "JP '435"). Applicant respectfully traverses.

Applicant notes that U.S. Patent 5,731,030 is the U.S. equivalent to JP '435. For ease of explanation only, Applicant references the U.S. Patent 5,731,030 to Frieze *et al.* (hereinafter "Frieze") in the remarks below.

Claim 16 depends from claim 1 and is patentable over Yang based on its dependency and for the additional features recited therein. Claim 16 recites, "wherein the measurement of the layer thickness is performed by a temperature measurement of the substrate surface." The Examiner cites JP '435 (Frieze) as explicitly disclosing, during plasma coating, measuring the substrate temperature provides an indication of the coating thickness, and, therefore, the Examiner submits that modifying Yang would have been obvious. See Office Action, page 8. Applicant respectfully disagrees.

Applicant submits that no *prima facie* case of obviousness has been established because (1) there is no teaching, suggestion, or reason to combine the cited portions of Yang, Anders, and Frieze; and (2) the cited portions of Yang, Anders, and Frieze, even if combined, do not disclose, teach, or render obvious each and every claim aspect.

Specifically, Frieze fails to remedy the deficiencies of Yang, Anders, and/or a combination thereof. Frieze fails to disclose, teach, or suggest at least, "choosing different process parameters such that, after the coating process, addition of the deposition profile results in a substantially uniform layer thickness of the coating on a part of the substrate, wherein one of the process parameters to be chosen is the distance between the at least two sources producing plasma plumes at the same time; and setting the distance such that the expanding plasmas substantially do not influence each other, in the sense that the shapes of the plasma plumes substantially correspond to the shape of a single plasma plume in a corresponding process chamber under otherwise corresponding process conditions," as recited in claim 1, and then measuring the thickness of such layer.

For at least the reason that the cited portions of Yang, Anders, and JP '435 (Frieze), either alone or in combination with one another, do not disclose, teach, or render obvious each and every claim aspect, the rejection of claim 16 should be withdrawn. Applicant respectfully requests acknowledgement that claim 16 is allowable over Yang, Anders, JP '435, and a combination thereof.

CONCLUSION

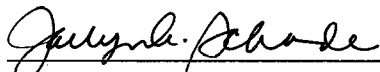
Having addressed each of the foregoing rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, the application is in condition for allowance. Notice to that effect is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

If an extension of time is necessary to prevent abandonment of this application, then such an extension of time is hereby petitioned for under 37 C.F.R. §1.136(a). Any fees required (including fees for net addition of claims) are hereby authorized to be charged to **Deposit Account No. 033975** (Ref. No. **008895-0325576**).

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